

REMARKS

Reconsideration of this application is respectfully requested in view of the foregoing amendment and the following remarks.

Claims 52-81 were pending in this application. In this Amendment, Applicants have amended claims 52, 53, 59, 73, 74, and 81, have canceled without prejudice claims 66, 67, and 69-72, and have added new claims 82-93. Accordingly, claims 52-65, 68, and 73-93 will be pending herein upon entry of this Amendment.

As an initial matter, in the Office Action mailed May 23, 2005, the Examiner withdrew from consideration claims 63-67, 69-72, 75-77, and 79 as not directed to the previously elected species corresponding to Figure 9H. In response, Applicants have canceled claims 66, 67, and 69-72. However, regarding claims 63-65, 75-77, and 79, Applicants respectfully submit that the features recited in these claims are directed to further embodiments of the species of Figure 9H, as described in paragraphs [0078] to [0086] immediately following the discussion of Figure 9H. Applicants therefore respectfully request that claims 63-65, 75-77, and 79 be examined on the merits.

In the Office Action, the Examiner objected to the drawings for failing to show the "plane of contact being tangent" feature recited in claim 60. The Examiner also objected to claims 53, 59, and 60 for informalities. Under 35 U.S.C. § 102(b), the Examiner rejected claims 52, 54-63, 68, 73, 74, 76 and 81 as being anticipated by U.S. Patent No. 5,772,451 to Dozier, II et al. ("Dozier"). The Examiner also rejected claim 53 under 35 U.S.C. § 103(a) as being unpatentable over Dozier et al. in view of Applicants' Admitted Prior Art. To the extent these rejections

might still be applied to claims presently pending in this application, Applicants respectfully traverse the rejections.

Applicants wish to thank Examiner Hammond for the courtesies extended to Applicants' representative during the interview conducted on August 25, 2005. The substance of the interview is incorporated into the following remarks.

Regarding the drawing objections, Applicants respectfully submit that the drawings do adequately show the "plane of contact being tangent" feature of claim 60, without requiring revision. In particular, Figures 5A and 5B illustrate how contact elements 74 curve away from the plane of contact with the respective solder balls, with the plane tangent to the side of the solder balls being contacted, as is described, for example, at paragraphs [0054] to [0055] of the present application. The contact elements 74 correspond to the contact element 152 shown in Figure 9H. Indeed, paragraph [0073] of the present application explains that Figures 9A to 9H illustrate processing steps for forming connector 70 of Figure 5A. Thus, Applicants respectfully submit that the drawings already show the "plane of contact being tangent" feature of claim 60.

Regarding the claim objections, Applicants have amended claim 53 to remove the recitation of "about" to positively recite the pitch by which the contact elements are separated. Applicants have also amended claim 59 to positively recite the solder balls so that the pitch and tangent of the balls can be given appropriate patentable weight. Applicants therefore respectfully request that these claim objections be withdrawn.

Regarding the § 102 and § 103 rejections, Applicants have amended claims 52 and 74 to clarify that the electrical circuit is embedded within the substrate of the connector of the present invention and that a contact element is formed on and electrically connected to an exposed

portion of the electrical circuit by metal plating. This plating, as part of an integrated circuit manufacturing process, can provide an integral construction between the contact and the circuit that is free from metal discontinuity or impedance mismatches. Support for the amendments can be found in the present application at, for example, Figure 9H, and paragraphs [0049], [0065], [0073]-[0077], [0085], and [0102].

Through metal plating, the present invention provides a continuous electrical path between a contact element and an embedded electrical circuit. In contrast, Dozier discloses an ordinary plated through hole 312 soldered to a resilient contact structure 320 and a solder ball 314. These soldered connections can introduce undesirable metal discontinuity and impedance mismatches in connecting a terminal 308 of the semiconductor package 304 to a terminal 306 of a printed circuit board 302. (*See, e.g.*, column 22, lines 30-48.) In addition, Dozier simply discloses a connector or socket 300 that provides connections between a semiconductor package 304 and a circuit board 302. There is no electrical circuit embedded within the substrate 310 of connector 300. Thus, Dozier fails to teach or suggest the embedded circuit and metal plating features of the present invention, as is recited in amended claims 52 and 74.

For these reasons, Applicants respectfully submit that amended independent claims 52 and 74 are patentable over Dozier. Applicants also respectfully submit that dependent claims 53-65, 68, 73, and 75-81 are also patentable due at least to their dependence on an allowable base claim.

Applicants have also added new dependent claims 82-93, which recite further patentably distinguishable features of a connector having an electrical circuit embedded within the substrate and a contact element electrically connected to the circuit by metal plating.

New claims 82 and 88 recite a continuous electrical path that is described in the present specification at, for example, paragraph [0077].

New claims 83 and 89 further recite that the electrical circuit electrically connects a first contact element to a second contact element of the connector. Support for this amendment can be found, for example, at paragraphs [0073] to [0077] of the present application. This feature further distinguishes the present invention over the device of Dozier, which does not have an electrical circuit formed within the substrate 310 of connector 300 that electrically connects a first contact element to a second contact element. Instead, the connector 300 of Dozier merely has isolated plated through holes 312, each with a resilient contact structure 320 on one side and a solder ball 314 on the other side. The resilient contact structures 320 are in no way electrically connected to each other through an electrical circuit formed within the substrate 310. In fact, Dozier teaches away from such a configuration since the Dozier socket is primarily intended to permit a semiconductor to be readily mounted to and readily demounted from a separate circuit board. (*See, e.g.,* column 22, lines 13-19 and 27-29 and column 23, lines 23-25.)

New claims 84 and 90 recite a third contact element that is electrically isolated from the first contact element, the second contact element, and the electrical circuit, which is described at, for example, paragraph [0076], stating that “circuit 145 can be formed to electrically connect *certain* contact elements together” (emphasis added).

New claims 85 and 91 recite the electrical circuit being completely embedded within the substrate except for the exposed portion, which is, for example, shown in Figure 9A and described at paragraph [0073].

Finally, new claims 86, 87, 92, and 93 recite the electrical circuit as being electrically connected to a capacitor or inductor formed in the substrate, which is described at, for example, paragraph [0076].

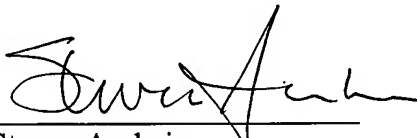
In view of the foregoing, all of the claims in this case are believed to be in condition for allowance. Should the Examiner have any questions or determine that any further action is desirable to place this application in even better condition for issue, the Examiner is encouraged to telephone Applicants' undersigned representative at the number listed below.

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Respectfully submitted,

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